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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DEBERRY, REGINA M	

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,902	ZHOU ET AL.	
	Examiner	Art Unit	
	Regina M. DeBerry	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *40-58* is/are pending in the application.

4a) Of the above claim(s) *47,50,52,53,55,57 and 58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *40-46,48,49,51,54 and 56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Status of Application, Amendments and/or Claims

The amendment filed 18 January 2002 has been entered in full. Claims 1-39 are cancelled. New claims 40-58 were entered.

Applicant's election of Group I (40-54 and 56) and species election of SEQ ID NO:36 in the reply filed on 02 August 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 47, 50, 52, 53, 55, 57 and 58 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group (or SEQ ID NO:), there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 02 August 2006.

Claims 40-46, 48, 49, 51, 54 and 56 are under examination.

Priority

Applicants do not disclose the claimed isolated nucleic acid molecule comprising elected SEQ ID NO:36 in foreign document Australia PQ 1675 (filed 19 July 1999). Therefore, the priority date of the claims that recite SEQ ID NO:36 of the instant application is deemed to be 19 July 2000. Should Applicant disagree with the Examiner's determination, it is incumbent upon Applicant to provide specific page and line numbers in the document, which specifically supports the particular claim limitation for which Applicant considers to have been in possession of.

Sequence Rules

The specification is not in compliance with 37 CFR 1.821-1.825 of the Sequence Rules and Regulations. When the description of a patent application discusses a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of the Sequence Rules and Regulations, reference must be made to the sequence by use of the assigned identifier (SEQ ID NO:), in the text and claims of the patent application. 37 CFR 1.821(a) presents a definition for nucleotide and/or amino acid sequences. This definition sets forth limits in terms of numbers of amino acids and/or numbers of nucleotides, at or above which compliance with the sequence rules is required. Nucleotide and/or amino acid sequences as used in 37 CFR 1.821 through 1.825 are interpreted to mean an unbranched sequence of four or more amino acids or an unbranched sequence of ten or more nucleotides. Please see MPEP section 2422.01.

The specification refers to sequences in Figures 8A-8C, 9 and 18B and on pages 13, lines 12 and 20; page 14, lines 15-16; page 15, lines 1-2 and 16-17; page 19, lines 1-4; page 30, lines 26-27 and 33; page 31, lines 1-6 and page 40, lines 14, 16 and 21, but does not identify the sequences by their sequence identifiers. Sequences appearing in drawings should be referenced in the corresponding Brief Description thereof. See 37 C.F.R. §1.58(a) and §1.83. The entire specification should be examined for proper sequence identifiers. Appropriate correction is required.

Applicant must submit a response to this Office Action and compliance with the sequence rules within the statutory period set for response to this Office Action.

Claim Rejections - 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 40-46, 48, 49, 51, 54 and 56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 40 (and dependent claims 41-46, 48, 49, 51, 54 and 56) is drawn to an isolated nucleic acid molecule which comprises a sequence encoding a protein which hybridizes under conditions of moderate to high stringency to a nucleic acid sequence. Stringency is relative, and the art does not recognize a single set of conditions as stringent. The specification also does not provide an unambiguous definition for the term. In the absence of a recitation of clear hybridization conditions (e.g., "hybridizes at wash conditions of A X SSC and B % SDS at CoC"), the claims fail to define the metes and bounds of the varying structures of polynucleotides recited in the claimed methods.

Claim 46 is indefinite because of the recitation, "gDNA". It is unclear what is meant by gDNA because the instant specification does not define the term. The metes and bounds of the instant claim cannot be determined.

Claim 56 is indefinite. It is unclear what the term "a modulator of expression or function of the polypeptide" encompasses. For example does the term mean increases and/or decreases in expression or function of the polypeptide. The specification does not define the term. Thus, the metes and bounds of the instant claim cannot be determined.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 40-46, 48, 49, 51, 54 and 56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The instant claims are drawn to an isolated nucleic molecule which comprises a sequence encoding a protein which inhibits osteoclast differentiation from haematopoietic cell precursors, selected from the group consisting of osteoclast inhibitory lectin (OCIL) and OCIL-related protein, and which either (i) hybridizes under conditions of moderate to high stringency to one or more nucleotide sequences (SEQ ID NO:36) or has greater than 80% sequence identity with one or more of the sequences set out in (i). Claim 56 is drawn to a method of treatment of a condition characterized by

abnormal bone resorption, comprising administering an effective amount of a modulator of expression of function of the polypeptide according to claim 54.

The instant specification examines the action of osteoclast inhibitory lectin (OCIL) proteins on osteoclast formation. The specification teaches SEQ ID NO:36 as the full length cDNA sequence of mouse osteoclast inhibitory lectin (mOCIL) (page 37, lines 13-19). The specification teaches that mOCIL protein treatment resulted in a 60% inhibition of sRANKL and hM-CSF stimulated osteoclast formation (page 45, Example 12 and Figure 21). The instant specification indicates that the polynucleotides are useful in that they encode a protein with a specific biological activity (inhibition of osteoclast differentiation).

However, the instant claims as recited, read on variant sequences because they lack clear hybridization conditions and recite sequence identities less than 100%. Absent factual evidence, a percentage sequence similarity of less than 100% is not deemed to reasonably support to one skilled in the art whether the biochemical activity of the claimed subject matter would be the same as that of such a similar known biomolecule. It is known for nucleic acids as well as proteins, for example, that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in many instances, albeit not in all cases. Furthermore, in the absence of a recitation of clear hybridization conditions, the nucleic acid will hybridize with unrelated DNA sequences, corresponding sequences from other species, mutated sequences, allelic variants, splice variants and so forth. There is no assurance that when the DNA is expressed, the recombinant protein will have the desirable properties of the invention.

The effects of these changes are largely unpredictable as to which ones have a significant effect versus not. The ordinary artisan would immediately recognize that an active or binding site must assume the proper three-dimensional configuration to be active; conformation is dependent upon surrounding residues; therefore substitution of non-essential residues can often destroy activity (Wells, 1990, Biochemistry 29:8509-8517). Applicant has provided little or no guidance beyond the mere presentation of sequence data to enable one of ordinary skill in the art to determine, without undue experimentation, the positions in the protein which are tolerant to change (e.g. such as by substitutions or deletions), and the nature and extent of changes that can be made in these positions.

Lastly, claim 56 is drawn to a method of treatment of a condition characterized by abnormal bone resorption, comprising administering an effective amount of a modulator of expression of function of the claimed polypeptide. The term "modulator" encompasses a large genus. The instant specification fails to indicate that a representative number of structurally related compounds are disclosed and therefore, the artisan would not know the identity of a reasonable number of representative compounds falling within the scope of the instant claim and would not know how to make them. The term "modulator" can encompass compounds, proteins, chemicals, antibodies, nucleic acid, lipids, macromolecules, etc. The specification does not address how to make and use the various molecules. In addition, it would be unpredictable whether the modulator of expression or function of the variant polypeptide

would have any affect. For example, an antibody or protein-binding molecule may not be able to bind and have any modulating affect on the variant polypeptide.

Due to the large quantity of experimentation necessary to generate the infinite number of derivatives recited in the claims for SEQ ID NO:36 and "modulators of expression or function" and screen same for activity, the lack of direction/guidance presented in the specification regarding same, the absence of working examples directed to same, the complex nature of the invention and the state of the prior art which establishes the unpredictability of the effects of mutation on protein structure and function, undue experimentation would be required of the skilled artisan to make and/or use the claimed invention in its full scope.

Claims 40-46, 48, 49, 51, 54 and 56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification provides adequate written description for SEQ ID NO:36, but not variants or mutants of SEQ ID NO:36 or "modulators of function or expression". Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, whatever is now claimed." (See page 1117.) The specification does

not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116).

With the exception of SEQ ID NO:36, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides or translated polypeptide, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. In the absence of a recitation of clear hybridization conditions, the nucleic acid probe will hybridize with unrelated DNA sequences, corresponding sequences from other species, mutated sequences, allelic variants, splice variants and so forth. None of these sequences meet the written description provision of 35 U.S.C. 112, first paragraph. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required. See Fiers v. Revel, 25 USPQ2d 1601 at 1606 (CAFC 1993) and Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016.

In addition, there is insufficient descriptive support for the genus "modulator of function or expression". The claimed invention is drawn to a method for treatment of a condition characterized by abnormal bone resorption, comprising administering an effective amount of a modulator of expression or function of the polypeptide. The instant method requires the use of undisclosed modulators. The specification does not demonstrate possession of the instant process steps, which require the use of undisclosed compounds. A modulator can encompass lipids, antibodies, nucleic acids, chemical analogs, biomolecules, macromolecules, etc. There is no structural element

correlative with the function. No structural characteristics of such a modulator are provided, nor is there any indication that applicant had possession of any modulator.

One cannot describe what one has not conceived. See Fiddes v. Baird, 30 USPQ2d 1481 at 1483. In Fiddes, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class. The specification provided only the bovine sequence.

The specification does not place any limit on the number of nucleotides substitutions, deletions, insertions and/or additions that may be made to SEQ ID NO:36. The specification does not provide any guidance as to what changes should be made and which regions of the instant protein are functionally and structurally critical. There is no description of variants of SEQ ID NO:36 that exist, while still maintaining function. Specific, not general guidance is what is needed. The disclosure fails to describe the common attributes or characteristics that identify the members of the genus, and because the genus is variant, SEQ ID NO:36 alone is insufficient to describe the genus.

Therefore, only isolated polynucleotide sequences set forth in SEQ ID NO:36, but not the full breadth of the claim meets the written description provision of 35 U.S.C. §112, first paragraph. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision (see page 1115).

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Regina M. DeBerry whose telephone number is (571) 272-0882. The examiner can normally be reached on 9:00 a.m.-6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brenda G. Brumback can be reached on (571) 272-0961. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RMD
10/12/06

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